KONSTANTINOV, N.N.; TIKHOVA, A.P.

Laboratory study of changes in vapor tension and specific weight of gasoline during its evaporation in storage and transportation. Trudy VNII NP no.5:3-15 '56. (MLRA 9:8)
(Gasoline--Transportation) (Evaporation)

KONSTANTINOV, N.N.

Experimental and theoretical study of evaporation losses of petroleum and petroleum products during their storage in tanks, filling and emptying of tanks. Trudy VNII NP no.5:16-85 '56. (MLRA 9:8)
(Evaporation) (Petroleum--Storage)

KONSTANTINOV, N.N.

Device for selecting average samples of crude oil. Trudy VNII NP no.5:122-128 '56. (MLRA 9:8)
(Petroleum--Analysis)

KONSTANTINOV, N.N.; SARAYEV, V.P.; SAVENKOV, N.I.

Time rates for filling and emptying vertical cylindrical tanks. Neft. khoz.34 no.7:51-56 Jl '56. (MIRA 9:10)
(Petroleum--Storage)

ALEKSANDROV, A.M.; ALEKSEYEV, T.S.; KONSTANTINOV, N.N.; PAVLOVSKIY, A.N.; LOSHAK, V.I.; SARAYEV, V.P.; YEFREMOVA, T.D., vedushchiy red.; POLOSINA, A.S., tekhn. red.

[Computing volumes of petroleum products; manual for technical personnel of tank farms] Kolichestvennyi uchet nefteproduktov; rukovodstvo dlia tekhnicheskogo personala neftoskladov. Moskva, Gos. nauchno-tekhn. izd-vo neft. i gorno-toplivnoi lit-ry, 1958. 330 p. (MIRA 11:8)

(Petroleum products)

KONSTANTINOV, Nikolay Nikolayevich for Doc Tech Sci on the basis of dissertation defended 30 June 59 in Council of Mos Order of Lenin Inst of Petrochemical and Gas Industry im Gubkin, entitled "Study of [redacted] processes of evaporation of petroleum [redacted] and petroleum products during their storage, ~~draining,~~ effusion, and ~~pouring in.~~ infusion." (BMVISSO USSR, 1-61, 25)

KL 20, 1959, 111

MATSKIN, L.A.; KOVALENKO, K.I.; BABUKOV, V.G.; KONSTANTINOV, N.N.; PONOMAREV, G.V.; FAL'CHIKOV, G.N.; PELENICHKO, L.G.; SHAMARDIN, V.M.; GLADKOV, A.A.; BRILLIANT, S.G.; SHEVCHUK, V.Ya.; SOSHCHENKO, Ye.M.; ALEKSANDROV, A.M.; BUNCHUK, V.A.; KRUPENIK, P.I.; MAYEVSKIY, V.Ya.; YELSHIN, K.V.; GAK, Kh.A.; POTAPOV, G.M.; KARDASH, I.M.; STEPURO, S.I.; KAPLAN, S.A.; SELIVANOV, T.I.; YEREMENKO, N.Ya.; ZHUZH, A.D.; USTINOV, A.A.; GIRKIN, G.M.; VOLOBUYEV, P.P.; CHERNYAK, I.L., nauchnyy red.; DESHALYT, M.G., vedushchiy red.; GENNAD'YEVA, I.M., tekhn.red.

[Combating losses of petroleum and petroleum products; materials of the All-Union Conference on Means of Combating Losses of Petroleum and Petroleum Products] Bor'ba s poteriami nefti i nefteproduktov; po materialam Vsesoiuznogo soveshchaniia po bor'be s poteriami nefti i nefteproduktov. Leningrad, Gos.nauchno-tekhn. izd-vo neft. i gorno-toplivnoi lit-ry, 1959. 157 p. (MIRA 13:2)

1. Nauchno-tekhnicheskoye obshchestvo neftyanoy i gazovoy promyshlennosti.

(Petroleum industry)

KONSTANTINOV, Nikolay Nikolayevich; MOLYUKOV, G.A., red.; SVYATITSKAYA, K.P., ved.red.; POLOSINA, A.S., tekhn. red.

[Controlling evaporation losses of petroleum and petroleum products] Bor'ba s poteriami ot ispareniia nefti i nefteproduktov. Moskva, Gos.nauchno-tekhn.izd-vo neft.i gorno-toplivnoi lit-ry, 1961. 259 p. (MIRA 14:12)

(Petroleum)

KONSTANTINOV, N.N.

Calculation of small breather losses. Neft. khoz. 38 no.7:53-60 Jl '60. (MIRA 14:10)
(Tanks)

APPROVED FOR RELEASE: 06/19/2000 CIA-RDP86-00513R000824410012-9"

KONSTANTINOV, Oleg A.

Severni Kavkaz. (Severo-Kavkazskii krai i Dagestan). [North Caucasus and Daghestan] Moskva, Gosizdat, 1928. 147 p. fold. maps (Ekonomicheskaia geografiia SSSR. SSSR po raionam)
"Ukazatel' ispol'zovannoi literatury": p. [142]-147.
Contains a chapter on transportation
DLC: HC337.C33K6 1928

Severnyi Kavkaz (Severo-Kavkazkii krai i Dagestan). [North Caucasus and Daghestan]. 2. izd., ispr. i dop. Moskva, Gosizdat, 1930. 158 p. 5 fold. maps. (Ekonomicheskaia geografiia SSSR po rainam).
"Ukazatel' isop'zovannoi litertury": p. [152]-158.
Means of transportation (p. 117).
Waterway (p. 119).
Railroad network (p. 121).
Volgo-Don Waterways (p. 130).
DLC: HC337.C33K6 1930

——— Ural'skaia oblast'; s prilozheniem kratkogo ocherka Bashkirskoi respubliki. [Ural Province with a short sketch of the Bashkir Republic]. Moskva, Gosizdat, 1926. 155 p. fold. map, (Ekonomicheskaia geografiia SSSR. SSSR po raionam).
Bibliography: p. 152-153.
Transportation (p. 114)
DLC: HC337.U9K57

SO: Soviet Transportation and Communications, A Bibliography, Library of Congress Reference Department, Washington, 1952, Unclassified.

KONSTANTINOV, Oleg A.

KONSTANTINOV, Oleg A. Ural'skaia oblast'. Izd. 3, ispr. i dopoln. Moskva, Gosizdat, 1929. 206 p. (Ekonomicheskaia geografiia SSSR po raionam).
Bibliography: P. 201-206.

CSt-H (2. ed.) DLC: HC337.U9K6
NN (2. ed.) 1920

SO: LC, Soviet Geography, Part II, 1951, Unclassified

KONSTANTINOV, Oleg A.

KONSTANTINOV, Oleg A. Severnyi Kavkaz (Severo-Kavkazskii Krai i Dagestan). Izd. 2, ispr. i dop. Moskva, Gosizdat, 1930. 158 p. (Ekonomicheskaia geografiia SSSR po raionam).
"Ukazatel' ispol'zovannoi literatury": p. 152-158.
DLC: HC337. C33K6 1930

HN(1.ed)

SO: LC, Soviet Geography, Part II, 1951, Unclassified

KONSTANTINOV, O.A.

KONSTANTINOV, O.A. Izmeneniia v geografii gorodov SSSR za sovetskii period.
(Voprosy geografii. Sbornik Shestoi, 1947. p. 11-46.).
DLC: G23.V6

SO: LC, Soviet Geography, Part II, 1951, Unclassified

1. KONSTANTINOV, O. A.

2. USSR (600)

4. Cities and Towns

7. American classification of Soviet cities, Izv. Vses. geog. ob-va 79, no. 2, 1947.

9. **Monthly List of Russian Accessions**, Library of Congress, May 1953, Unclassified.

KONSTANTINOV, O. A.

PA5/49T35

USSR/Geography
Maps
Coal

May/Jun 48

"K. I. Spidekenko's 'Towns of the Kuznets Coal Field (Geographical and Economical Outline),'" O. A. Konstantinov, 3¼ pp

"Iz v-s Geog Obshch" Vol LXXX, No 3

Favorably reviews book, first in its field. First part gives natural and artificial factors conditioning growth of the towns. Second part gives general description of towns, followed by separate essays on most important ones. Book contains many maps, town

5/49T35

[redacted]/Geography (Contd) May/Jun 48

plans, and illustrations. Published by Geografgiz, Moscow, 1947, 145 pp, price 6 rubles, 50 kopeck.

[redacted] 5/49T35

KONSTANTINOV, O. A. PA 48/49T45

USSR/Geography Mar/Apr 49
Publications

"Review of 'Problems of Geography,'" O. A. Konstantinov, 4 pp

"Iz v-s Geograf Obshch" Vol LXXXI, No 2

This symposium, fifth of a series, is devoted to population geography. Reviews favorably. Published by State Pub House For Geog Lit, Moscow 1947, 212 pp.

[redacted] 48/49T45

KONSTANTINOV, O, A.

"The So-Called 'Law of the Primate City'," Iz. v-s Geograf Obshch., 81, No.2, 1949

KONSTANTINOV, O. A.

Geography, Economic

Views of Academician A. A. Grigor'yev on Methodology of economic geography. Isz. Vses. geog. obshch., 84, No. 1, 1952.

Monthly List of Russian Accessions, Library of Congress, March 1952. UNCLASSIFIED.

KONSTANTINOV, O.A. FA 246T69

USSR/Geography - Volga Jan/Feb 53

"Review of V.V. Pokshishevskiy's Book 'Along the Volga,'" O. A. Konstantinov (reviewer)

"Iz V-S Geograf Obshch" Vol 85, No 1, pp 104-107

States that reviewed book, "Povolzh'ye," is one of the better popular-scientific works on geography. Published by Molodaya Gvardiya, Moscow, 1951, 253 pp.

246T69

KONSTANTINOV, O.A.

Significance to economic geography of I.V.Stalin's work "Economic problems of socialism in the U.S.S.R." Izv.Vses.geog.ob-va 85 no.4:333-348 Jl-Ag '53. (MLRA 6:8)

(Economics) (Geography, Economic)

KONSTANTINOV, O.A.

Some problems in training new scientific personnel in geography.
Izv.Vses.geog.ob-va 86 no.1:7-19 Ja-F '54. (MLRA 7:2)
(Geography--Study and teaching)

KONSTANTINOV, O.A.

Cities of the Ukrainian S.S.R. Izv.Vses.geog.ob-va 86 no.3:215-228 My-Je '54.
(MLRA 7:6)

(Ukraine--Cities and towns) (Cities and towns--Ukraine)

KONSTANTINOV, O.A.

History and present state of economic geographical sciences in the U.S.S.R. Izv.Vses.geog.ob-va no.3:259-266 My-Je '55. (Geography, Economic) (MLRA 8:9)

KONSTANTINOV, O.A.

"A service classification of American cities" [in English]. H.J. Nelson. Reviewed by O.A. Konstantinov. Izv.AN SSSR.Ser.geog. no.3: 148-152 My-Je '56. (MLRA 9:11)
(United States--Cities and towns) (Nelson, H.J.)

KONSTANTINOV, O.A.

Cities and urban population of the U.S.S.R. at the beginning of the sixth five-year plan. Geog.v shkole 19 no.5:5-13 S-O '56. (MLRA 9:11)

(Cities and towns--Growth)

KONSTANTINOV, O.A.

City settlements of the Urals. Vop.geog. no.38:78-103 '56. (MLRA 9:9)

(Ural Mountain region--Cities and towns)

APPROVED FOR RELEASE: 06/19/2000 CIA-RDP86-00513R000824410012-9"

KONSTANTINOV, O.A.

Some urgent problems of Soviet geography. Izv.Vses.geog.ob-va 88 no.3:280-285 My-Je '56. (MIRA 9:9)
(Geography)

KONSTANTINOV, O.A.

Changes in location of industrial forces of the U.S.S.R. in the sixth five-year plan. Izv.Vses.geog.ob-va 88 no.4:351-363 Jl-Ag '56. (MLRA 9:10)

(Industries, Location of) (Russia--Economic policy)

KONSTANTINOV, O.A.

Some impressions of geographical science in Austria. Izv.AN SSSR.Ser. geog.no.1:136-138 Ja-F '57. (MLRA 10:4)
(Austria--Geography--Study and teaching)

KONSTANTINOV, O.A.

Study of economic geography in the Geographical Society during the 40 years of the Soviet regime. Geog.sbor. no.11:131-187 '57. (MIRA 11:1)

(Geographical societies)
(Geography, Economic)

KONSTANTINOV, O.A.

Classification of cities in economic geography. Vop. geog. no.41: 65-92 '57. (MIRA 10:12)

(Geography, Economic) (Cities and towns)

KONSTANTINOV, O.A.

Centennial anniversary of the Vienna Geographic Society. Izv.Vses. geog.ob-va 89 no.1:81-85 Ja -F '57. (MIRA 10:3)
(Vienna--Geographical societies)

KONSTANTINOV, O.A.

"Towns of the Fergana Valley" by N.V. Smirnov. Reviewed by O.A. Konstantinov. Izv. Vses. geog. ob-va 89 no.6:557-559 N-D '57.
(Fergana Valley--Cities and towns) (MIRA 10:12)
(Smirnov, N.V.)

KONSTANTINOV, O.A.

AUTHOR: Konstantinov, O.A. 12-1-25/26

TITLE: The Second Czechoslovakian Scientific Conference on Economic Geography (Vtoraya chekhoslovatskaya nauchnaya konferentsiya po ekonomicheskoy geografii)

PERIODICAL: Izvestiya Vsesoyuznogo Geograficheskogo Obshchestva, 1958, # 1, pp 102 - 105 (USSR)

ABSTRACT: The second Czechoslovakian scientific conference on economic geography was convened by the Section of Economic Geography of the Institute of Economics attached to the Czechoslovakian Academy of Sciences. It took place at the Castle of Libice from 30th September to 3rd October 1957, and concentrated on problems connected with the organization of economic districts. Foreign guests had been invited, and 11 personalities from abroad were present. They came from Poland, the German Democratic Republic, the USSR, Hungaria, Yugoslavia and France.

The conference heard the following reports: Professor Grushka from the Section of Economic Geography of the Institute of Economics attached to the Czechoslovakian Academy of Sciences (Otdeleniye ekonomicheskoy geografii Instituta ekonomiki Chekhoslovatskoy Akademii nauk) on "Problems of Selecting Large Economic Districts, and Methods of Their Study"; Academi-

Card 1/4

"Selection and Investigation of Large Economico-Geographic Administrative Units of Southern Poland"; Doctor Klatsman from the Paris National Institute of Statistics on "Principles of Selecting Economic Districts"; Dotsent Yakob from the Halle Martin Luther University on "Problems of Organizing Economic Districts in the German Democratic Republic"; Doctor Vrubel' from the Polish Academy of Sciences at Warsaw on "Works on the

Card 2/4

12-1-25/26

The Second Czechoslovakian Scientific Conference on Economic Geography

Organization of Economic Districts in the Polish People's Republic"; N.F. Yanitskiy, Doctor of Geographic Sciences from the Geographic Institute of the USSR Academy of Sciences at Moscow (Institut geografii AN SSR, Moscow) on "Problems Pertaining to Methods of Organizing Economic Districts in European Countries of People's Democracies".

Professor Korchak, Dotsent Shim, Dotsent Blazhek, Doctor Gurskiy, Doctor Votrubets and Doctor Strchid, all Czechoslovakian economic-geographers, delivered concluding lectures.

The conference stressed in its resolution the scientific and practical importance of organizing economic districts and the necessity of a permanent contact between scientists from other countries. The conference suggested organizing conferences in countries which are interested in this subject. Academician Leshchitskiy, Director of the Geographic Institute of the Polish Academy of Sciences proposed to organize at this institute an office, dealing with the organization of economic districts and the collection and publishing of bibliographic material from various countries. This proposition was approved.

Card 3/4

Konstantinov, O.A.

12-1-26/26

AUTHOR: Konstantinov, O.A.

TITLE: The Society of Natural Sciences and Geography of the Rumanian People's Republic (V obshchestve yestestvoznaniya i geografii Rumynskoy Narodnoy Respubliki)

PERIODICAL: Izvestiya Vsesoyuznogo Geograficheskogo Obshchestva, 1958, # 1, pp 105 - 107

ABSTRACT: The month of Soviet-Rumanian friendship from 7th October to 7th November 1957, was devoted to the 40th anniversary of the October Revolution. At this occasion the Society of Natural Sciences and Geography of the Rumanian People's Republic organized a special scientific session on 18th and 19th October which took place at Bucharest. Two Soviet geographists G.D. Richter and the author had been invited. There were no plenary sessions and three sections were organized: the geological-geographical, the botanical and the zoological section. A total of 22 reports was delivered in two sessions of the geological and geographic sections; these reports were divided into three groups: 1) reports on Soviet themes, 2) reports on Rumanian themes and 3) reports on special themes.

The author mentions some deficiencies existing in the

Card 1/2

SOV/10-58-6-7/21

AUTHOR: Konstantinov, O.A.

TITLE: The Present Status of the Classification of Inhabited Settlements of the USSR into Urban and Rural Localities (Sovremennoye sostoyaniye deleniya naselennykh punktov SSSR na gorodskiye i sel'skiye)

PERIODICAL: Izvestiya Akademii nauk SSSR, Seriya geograficheskaya, 1958, Nr 6, p 69-78 (USSR)

ABSTRACT: The author describes different laws and decisions dealing with the problem of the classification of different inhabited settlements of the USSR into rural and urban localities, workers' settlements and health resorts. He stresses the different approach to the problem by some republics, and finds that the time has come to elaborate standard principles of classification. There are 5 Soviet references.

Card 1/2

SOV/10-58-6-7/21

The Present Status of the Classification of Inhabited Settlements of the USSR into Urban and Rural Localities

ASSOCIATION: Leningradskiy finansovo-ekonomicheskiy institut (The Leningrad Financial Economic Institute)

Card 2/2

KONSTANTINOV. O.A.

KONSTANTINOV, O.A.

In Austria; a traveler's notes. Geog. v shkole 21 no.2:8-17 Mr-Ap '58. (MIRA 11:2)
(Austria--Geography--Study and teaching)

KONSTANTINOV, O.A.

"Elimination of economic inequalities among peoples of the Soviet East and the socialist distribution of industry" by P.M.Alampiev. Reviewed by O.A. Konstantinov. Izv.Vses.geog.ob-va 90 no.5:483-485 S-O '58. (MIRA 11:11)
(Kazakhstan--Industries) (Alampiev, P.M.)

AUTHOR: Konstantinov, O.A. SOV/12-90-6-12/23

TITLE: Reviews (Retsenzii)

PERIODICAL: Izvestiya vsesoyuznogo geograficheskogo obshchestva, 1958, Vol 90, Nr 6, pp 553 - 555 (USSR)

ABSTRACT: The author gives a review of the book "Geography and Economy" (Geografiya i khozyaystvo), Volume 1, published by the Geographical Department of the Moskovskiy gosudarstvennyy universitet imeni Lomonosova (Moscow State University imeni Lomonosov).

Card 1/1

SAUSHKIN, Yu.G.; KALASHNIKOVA, T.M.; KONSTANTINOV, O.A., red.

[Present-day problems in the economic regionalization of the U.S.S.R.; materials for the 3d Congress of the Geographical Society of the U.S.S.R.] Sovremennye problemy ekonomicheskogo raionirovaniia SSSR; materialy k III s"ezdu Geograficheskogo obshchestva Soiuza SSR. Leningrad, Geogr. ob-vo SSSR, 1959. 15 p. (MIRA 15:3)

(Economic zoning)

KUGUKALO, I.A.; KORETSKIY, L.M.; VELICHKO, I.A.; KONSTANTINOV, O.A.,
red.

[Economic regionalization of the Ukrainian S.S.R.; materials for the 3d Congress of the Geographical Society of the U.S.S.R.] Ob ekonomicheskom raionirovanii Ukrainskoi SSR; materialy k III s"ezdu Geograficheskogo obshchestva Soiuza SSR. Leningrad, Geogr. ob-vo SSSR, 1959. 16, 2 p. (MIRA 15:3)
(Ukraine--Economic zoning)

ALAMPIYEV, P.M.; KONSTANTINOV, O.A., red.

[Problems of the general economic regionalization of the U.S.S.R. at the present-day stage; materials for the 3d Congress of the Geographical Society of the U.S.S.R.] Problemy general'nogo ekonomicheskogo raionirovaniia SSSR na sovremennom etape; materialy k III s"ezdu Geograficheskogo obshchestva Soiuza SSR. Leningrad, Geogr. ob-vo SSSR, 1959. 22 p. (MIRA 15:3)

(Economic zoning)

KONSTANTINOV, O.A.

[Present state of economic and gepgraphical studies on economic regionalization in the U.S.S.R.; materials for the 3d Congress of the Geographical Society of the U.S.S.R.] Sovremennoe sostoianie ekonomiko-geograficheskikh issledovanii po ekonomicheskomu raionirovaniiu v SSSR; materialy k III s"ezdu Geograficheskogo obshchestva Soiuza SSR. Leningrad, Geogr. ob-vo SSSR, 1959. 31 p. (MIRA 15:3)
(Geography, Economic--Research) (Economic zoning)

KONSTANTINOV, Oleg Arkad'yevich; KOSTINSKIY, D.N., red.; NOGINA, N.I., tekhn.red.

[Touring across Austria; travel impressions of a geographer]
Po Avstrii; putevye vpechatleniia geografa. Moskva, Gos.izd-vo geogr.lit-ry, 1959. 71 p. (MIRA 13:2)
(Austria--Description and travel) (Geography--Congresses)

GERASIMOV, I.P., red.; KALESNIK, S.V., red.; KONSTANTINOV, O.A., red.; MURZAYEV, E.M., red.; SALISHCHEV, K.A., red.; IGNAT'YEV, G.M., red.; ABRAMOV, L.S., red.; KONOVALYUK, I.K., mladshiy red.; MAL'CHEVSKIY, G.N., red.kart; GLEYKH, D.A., tekhn.red.

[Soviet geography; results and tasks] Sovetskaia geografiia; itogi i zadachi. Moskva, Gos.izd-vo geogr.lit-ry, 1960. 634 p.
(MIRA 13:12)

1. Geograficheskoye obshchestvo SSSR.
(Geography)

KONSTANTINOV, O.A.

"Contemporary Status of Economic-Geographic Research on the Economic Division of the USSR."

report presented at the 3rd Congress of the Geographical Society of the USSR, Kiev 30 Jan-7 Feb 60

KONSTANTINOV, O. A.

"Modifications in the Geography of Cities and in That of the Urban Population of the USSR from 1939 to 1959."

report to be submitted for the Intl. Geographical Union, 10th General Assembly and 19th Intl. Geographical Congress, Stockholm, Sweden, 6-13 August 1960.

KONSTANTINOV, O.A.

Awarding medals and prizes of the Geographical Society of the U.S.S.R. for 1958. Izv. AN SSSR. Ser. geog. no.5:157-158 S-O '60. (MIRA 13:10)

(Geographical societies) (Rewards (Prizes, etc.))

KONSTANTINOV, O.A.

"Soviet geography." Vol.1, nos. 1-2, 1960. Reviewed by O.A.Konstantinov. Izv.Vses.geog.ob-va 92 no.5:468-470 S-O '60. (MIRA13:9)

(Geography--Periodicals)
(American periodicals)

KONSTANTINOV, O.A.

Awarding medals and prizes of the Geographical Society of the U.S.S.R. for 1958. Izv. vses. geog. ob-va 92 no.6:548-549 N-D '60.
(MIRA 14:1)

(Geographical societies) (Rewards (Prizes, etc.))

KONSTANTINOV, O.A.

Methodological confusion in theoretical problems of geography ("Theoretical problems in geography" by V.A.Anuchin. Reviewed by O.A.Konstantinov). Izv. AN SSSR. Ser. geog. no. 4:146-149 Jl-Ag '61. (MIRA 14:7)

(Geography--Methodology)
(Anuchin, V. A.)

KONSTANTINOV, O.A.

"On the development of the science of geography in the Estonian S.S.R., 1940-1960." Reviewed by O.A.Konstantinov. Izv.Vses.geog. ob-va 93 no.5:455-457 S-O '61. (MIRA 14:10)
(Estonia--Geography)

AL'TMAN, L.P.; NEVEL'SHTEYN, G.S.; KONSTANTINOV, O.A., doktor geogr. nauk, prof., otv. red.; GOMOZOVA, N.A., red.; KUZNETSOV, N.S., red. kart; BAZANOVA, A.A., tekhn. red.

[Petrozavodsk, the capital of the Karelo-Finnish S.S.R.]Petrozavodsk, stolitsa Karelo-Finskoi SSR. Moskva, Gos.izd-vo geogr. lit-ry, 1951. 47 p. (MIRA 16:1)
(Petrozavodsk)

ALAMPIYEV, P.M.; ZHIRMUNSKIY, M.M.; KLUPT, V.S.; KONSTANTINOV, O.A.; MILETKOVSKIY, A.G.; SEMEVSKIY, B.N.; FEYGIN, Ya.G.; SHISHKIN, N.I.; YANITSKIY, N.F.

Letter to the editors of the journal "Izvestiia AN SSSR, Seriia Geograficheskaia." Izv.AN SSSR. Ser.geog. no.6:146-147 N-D '62.
(MIRA 15:12)

(Geography, Economic)

KONSTANTINOV, O.A.

Several results of the First Interdepartmental Conference on the Geography of Population. Izv.Vses.geog.ob-va 95 no.1:32-40 Ja-F '63. (MIRA 16:4)

(Demography—Congresses)

KONSTANTINOV, O.A.

Network of cities on the territories which became part of the U.S.S.R. in 1939. Izv. AN SSSR. Ser. geog. no.4:23-34 Jl-Ag '63. (MIRA 16:8)

1. Leningradskiy pedagogicheskiy institut im. A.I.Gertsena. (Russia, Northwestern--Cities and towns)

ALAMPIYEV, P.M.; VOL'F, M.B.; ZHIRMUNSKIY, M.M.; KLUPT, V.S.; KONSTANTINOV, O.A.; MILEYKOVSKIY, A.G.; SEMEVSKIY, B.N.; FEYGIN, Ya.G.; SHISHKIN, N.I.; YANITSKIY, N.F.

In reference to IU.G.Saushkin's reply. Izv. AN SSSR. Ser. geog. no.3:156-158 My-Je '63. (MIRA 16:8)
(Geography, Economic)

PAVLOVSKIY, Ye.N., akademik, glav. red.; KONSTANTINOV, O.A., doktor geogr. nauk, otv. red.

[Geography of the population in the U.S.S.R.; basic problems] Geografiia naseleniia v SSSR; osnovnye problemy. Moskva, Izd-vo "Nauka," 1964. 278 p. (MIRA 17:6)

1. Geograficheskoye obshchestvo SSSR. 2. Leningradskiy pedagogicheskiy institut im. A.I.Gertsena (for Konstantinov).

KONSTANTINOV, O.A.

On the 30th anniversary of the Department of Economic Geography.
Izv. Vses. geog. ob.-va 97 no.2:105-111 Mr-Ap '65. (MIRA 18:5)

PILIYA, A.D. [translator]; ZEL'TSER, G.I. [translator]; LEMBERG, I.Kh. [translator]; KONSTANTINOV, O.V. [translator]; SHUT'KO, A.V. [translator]; SLIVA, L.A., red.; BURTSEV, A.K., red.; SOKOLOVA, T.S., tekhn.red.

[Deformation of atomic nuclei; generalized nucleus model and the Coulomb excitation mettod. Articles translated from the English] Deformatsiia atomnykh iader; obobshchennaia model' iadra i metod kulonovskogo vozbuzhdeniia. Sbornik statei. Moskva, Izd-vo inostr.lit-ry, 1958. 383 p. (MIRA 14:5)

(Nuclear shell theory) (Nuclei, Atomic)

24(5) SOV/56-37-3-29/62

AUTHORS: Konstantinov, O. V., Perel', V. I.

TITLE: The Quantum Theory of the Spatial Dispersion of Electric and Magnetic Susceptibility

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 37, Nr 3(9), pp 786-792 (USSR)

ABSTRACT: In the introduction several publications dealing with the investigations of spatial dispersion effects occurring during the passage of electromagnetic waves through matter are discussed. Ginzburg (Ref 2) as well as Agranovich and Rukhadze (Ref 3) built up the tensor of the dielectric constant in consideration of spatial dispersion on a phenomenological basis, whereas Shafranov (Ref 4) and Klimontovich (Ref 7) derived this tensor for a classical gas of charged particles. Also a number of other authors worked with the particle model. Also two Japanese papers are briefly discussed. In the present paper the authors derive expressions, on the basis of the selfconsistent field method, for the magnetic susceptibility and conductivity in consideration of spatial dispersion, and investigated the general interrelations between conductivity

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described by a conductivity dependent on frequency and wave vector and by a magnetic susceptibility which depends only on

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The Quantum Theory of the Spatial Dispersion of Electric and Magnetic Susceptibility

the wave vector. For the relation of magnetic susceptibility and the specific magnetic moment in a constant homogeneous field it holds that $\chi_{ln}(0) = \partial M_l(\vec{H})/\partial H_n$. The authors finally thank Professor L. E. Gurevich for advice and discussions. There are 12 references, 7 of which are Soviet.

ASSOCIATION: Leningradskiy fiziko-tekhnicheskiy institut Akademii nauk SSSR (Leningrad Physico-technical Institute of the Academy of Sciences, USSR)

SUBMITTED: April 9, 1959

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87464

S/057/60/030/012/011/011
B019/B056

9.9845
24.2120 (1155, 1482, 1160)

AUTHORS: Konstantinov, O. V. and Perel', V. I.

TITLE: Energy Distribution of Fast Neutral Atoms Emitted by Plasma

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1960, Vol. 30, No. 12, pp. 1485 - 1488

TEXT: It was the purpose of the present work to find a relation between the energy distribution of emitted neutral atoms and the ion distribution in plasma. Proceeding from the kinematic equation

$$v_x \frac{\partial f(x,\vec{v})}{\partial x} = N(x)\overline{v_e \sigma_i(v_e)} f(x,v) - f(x,\vec{v})N(x)\int \varphi(v')\sigma_n(|\vec{v} - \vec{v}'|)|\vec{v} - \vec{v}'|d\vec{v}' + N(x)\varphi(\vec{v})\int f(x,\vec{v}')\sigma_n(|\vec{v} - \vec{v}'|)|\vec{v} - \vec{v}'|d\vec{v}' \quad (1),$$

the authors obtain a relation for the density of the atomic flux, composed of three terms: $j(v) = j_1(v) + j_2(v) + j_3(v)$, $j_1(v)$ is the fraction produced by the charge exchange of the primary ionic flux.

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Energy Distribution of Fast Neutral Atoms Emitted by Plasma

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$$j_1(v) = \frac{I\varepsilon}{u\sigma} \cdot \frac{v\sigma_{\Pi}(v)}{1+v_0\sigma(v)/u\sqrt{3}\sigma}\,\psi(v)$$ (8) holds. $j_2(v)$ is the fraction occurring after a multiple charge exchange.

$$j_2(v) = \frac{I\varepsilon\eta}{u\sqrt{\sigma\sigma_{\Pi}^{*}}} \cdot \frac{v\sigma_{\Pi}(v)}{1+\sigma(v)/\sqrt{3}\sqrt{\sigma\sigma_{\Pi}^{*}}}\,\psi(v)$$ (9) holds. $j_3(v)$ is the fraction that comes immediately from the opposite wall. It holds that

$$j_3(v) = \frac{\sqrt{3}\,Iv}{v_0} F_0(v)\exp(-N_0\sigma(v)a)$$ (10). In this formula $f(x,\vec{v})$ is the distribution function of the atoms, $N(x)$ the ion concentration, $\psi(v)$ the normalized distribution function of the ions, $\sigma_{\Pi}(v)$ is the charge exchange cross section, $\sigma_i(v_e)$ is the electron ionization cross section. I is the total density of the atomic flux from the wall, v_0 the mean velocity of the atoms coming from the wall. D. N. Zubarev and

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Energy Distribution of Fast Neutral Atoms Emitted by Plasma

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B019/B056

V. N. Klimov are mentioned. The authors thank L. E. Gurevich for discussions. There are 3 references: 2 Soviet and 1 US.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN SSSR Leningrad (Institute of Physics and Technology of the AS USSR, Leningrad)

SUBMITTED: July 15, 1960

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KONSTANTINOV, O.V.; PEREL', V.I.

Possibility of the passage of electromagnetic waves through metals in a strong magnetic field. Zhur. eksp. i teor. fiz. 38 no.1: 161-164 Jan '60. (MIRA 14:9)

1. Leningradskiy fiziko-tekhnicheskiy institut AN SSSR.
(Electromagnetic waves) (Magnetic fields)

KONSTANTINOV, O.V.; PEREL', V.I.

Graphical technique for computation of kinetic quantities. Zhur. eksp. i teor. fiz. 39 no. 1:197-208 Jl '60. (MIRA 13:12)

1. Leningradskiy fiziko-tekhnicheskiy institut AN SSSR. (Mechanics, Analytic)

S/056/60/039/003/040/045
B006/B063

26.1410

AUTHORS: Konstantinov, O. V., Perel', V. I.

TITLE: Collision of Particles in a High-temperature Plasma

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 39, No. 3(9), pp. 861-871

TEXT: Following a previous paper (Ref. 1) in which the authors derived a generalized equation of motion for electrons interacting with one another, with phonons, and with neutral impurity centers, the authors now apply the method developed in Ref. 1 to a quasi-neutral plasma. The ordinary equation of motion, which takes only pair collisions into account, is not applicable as the total bremsstrahlung scattering cross section in the case of Coulomb interaction diverges logarithmically. The transition probability for a fast electron passing through an equilibrium electron gas whose volume charge is compensated by a blurred positive charge, was exactly calculated by A. I. Larkin (Ref. 2). The authors of the present article frequently refer to this paper. The question as to whether the collision term in the equation of motion can only be described by the

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Collision of Particles in a High-temperature Plasma

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introduction of pair collisions is examined next. The motion of ions is taken into account, and the part played by it in the screening of the interaction is investigated. It is found that the effect of ions on the interaction screening should be taken into account for electron - ion collisions. The collision cross sections for electron - electron and electron - ion interactions are calculated without artificial cutoff of the interaction. The role played by plasma oscillations in plasma kinetics is also studied. The equations for the single-particle density matrix of a system of interacting electrons and ions are derived in the first section. The second section deals with the calculation of the impact term and with the renormalization of graphs. The third section discusses the self-consistent field and the free term in the equation of motion. In the fourth section, the equation of motion is written down and discussed. In the fifth section, the authors discuss the range of application of the relations obtained. L. E. Gurevich is thanked for advice and discussions. There are 11 figures and 4 references: 3 Soviet and 1 Dutch.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk SSSR (Institute of Physics and Technology of the Academy of Sciences USSR)

SUBMITTED: April 30, 1960

Card 2/2

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S/056/60/039/003/040/045
B102/B201

AUTHORS: Konstantinov, O. V., Perel', V. I.

TITLE: Collision of particles in a high-temperature plasma

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 39, no. 3 (9), 1960, 861-871

TEXT: The present paper is a continuation of a previous investigation by the same authors (ZhETF, 39, 7, 1960), in which they had derived a generalized kinetic equation for electrons interacting with one another, with phonons, and with neutral impurity centers. The method developed there is now applied to a quasineutral plasma. As is well known, the total bremsstrahlung scattering cross section diverges logarithmically in the case of Coulomb interaction; for this reason, the usual kinetic equation taking into account only pair collisions is not applicable to this case. This difficulty is generally bypassed by cutting off the collision parameter at distances of the order of the Debye radius. A. I. Larkin (ZhETF, 37, 264, 1959) has calculated the transition probability for a fast electron traveling through an equilibrium electron gas. A still unanswered question, however, is

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whether the collision term in the kinetic equation can be described only by the introduction of pair collisions; this problem was the object of the present investigation. Also ion motion is considered here, and the part played by it in the screening of interaction is examined. The kinetic equation obtained here is used to determine the kinetic coefficients more exactly. Equations for the single-particle density matrices for electrons and ions are derived first. A system is considered, consisting of interacting electrons and ions and being described by the Hamiltonian $H = H_o + U$, $H_o = \sum_k (\varepsilon_k a_k^+ a_k + E_k A_k^+ A_k)$, $U = U_{ee} + U_{ei} + U_{ii}$. Here,

$$U_{ee} = \frac{1}{2} \sum_{q+q',f,f'} u_{q-q'} a_q^+ a_{q'} a_f^+ a_{f'} \delta_{q+f,q'+f'},$$

$$U_{ei} = - \sum_{q+q',f,f'} u_{q-q'} a_q^+ a_{q'} A_f^+ A_{f'} \delta_{q+f,q'+f'},$$

$$U_{ii} = \frac{1}{2} \sum_{q+q',f,f'} u_{q-q'} A_q^+ A_{q'} A_f^+ A_{f'} \delta_{q+f,q'+f'};$$

A,

where k, q, f denote the wave vectors, $\varepsilon_k = \hbar^2 k^2/2m$ the electron energy, $E_k = \hbar^2 k^2/2M$ the ion energy, A_k^+, a_k^+ the ion and electron production operators, $u_\gamma = V^{-1} 4\pi e^2 \gamma^{-2}$, V the volume of the system. A weak electric field is applied to this system; the addition F_t to the density matrix of the system is then proportional to the electric field strength E_μ

$$F_t = \int_{-\infty}^{0} d\tau \int dx E_\mu (\mathbf{x}, t+\tau) \int_0^\beta d\lambda \, [J_\mu^e (\mathbf{x}, \tau + i\hbar\lambda) + J_\mu^i (\mathbf{x}, \tau + i\hbar\lambda)] F_0. \qquad 3.$$

Here, J_μ^e and J_μ^i are the current density operators, $F_o = Z^{-1}\exp(-\beta H')$, $Z = \mathrm{Sp}\exp(-\beta H')$, $H' = H - \mu N$, N is the operator of the total particle number, μ is the chemical potential. Thus one obtains the correction to the single-particle density matrix for electrons and ions:

$$L_\gamma (z_1, z_2) = \sum_{q, q'} \mathrm{Sp}\, \{ e^{-\beta H_0} T_C \exp \left(\frac{1}{i\hbar} \int_C U_z dz \right) (B_{q, q+\gamma})_{z_1} (B_{q'+\gamma, q'})_{z_2} \} Z^{-1}, \qquad (4)$$

$$B_{kp} = a_k^+ a_p + A_k^+ A_p. \qquad (5)$$

$$L_\gamma (z_1, z_2) = L_{-\gamma} (z_1, z_2).$$

After several calculations, the system of the two generalized kinetic equations for $f_{pp'}$ and $\varphi_{pp'}$ (according to the graph equations in Fig. 2) acquires the form

$$(s+i\omega_{p+\varkappa,p})f_{p,p+\varkappa}=r_{p,p+\varkappa}+\sum_q f_{q,q+\varkappa}w^{ee}_{qp}+\sum_q \varphi_{q,q+\varkappa}w^{ie}_{qp},$$
$$(s+i\Omega_{p+\varkappa,p})\varphi_{p,p+\varkappa}=R_{p,p+\varkappa}+\sum_q \varphi_{q,q+\varkappa}w^{ii}_{qp}+\sum_q f_{q,q+\varkappa}w^{ei}_{qp}. \quad (3a)-(3b);$$

$\hbar\omega_{kp}=\varepsilon_k-\varepsilon_p$, $\hbar\Omega_{kp}=E_k-E_p$. The impact term is then calculated. With the interaction potential rapidly decreasing with growing distance, the possible graphs for w^{ee} and w^{ie} are shown in Born's approximation in Figs. 3, 4. From them (in the case of a nondegenerate gas) one proceeds to those shown in Fig. 5. For a regular plasma line

$$L_\gamma(z_1,z_2)=L_\gamma(t_1-t_2)=\sum_{q,q'}\mathrm{Sp}\{e^{-\beta H}B_{q,q+\gamma}(t_1)B_{q'+\gamma,q'}(t_2)\}Z^{-1}. \quad (6)$$

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is obtained. and

$$L_\gamma(z_1, z_2) = \bar{L}_\gamma(t_1 - t_2) = \sum_{q, q'} \mathrm{Sp}\,\{e^{-\beta H} B_{q'+\gamma, q'}(t_2)\, B_{q, q+\gamma}(t_1)\}\, Z^{-1}. \qquad (7)$$

for an irregular one (z_1 and z_2 denote the left-hand and right-hand ends of the graph, $L_\gamma(z_1, z_2 = L_{-\gamma}(z_1, z_2)$, γ is the wave vector; the block shown in Fig. 5b is designated as plasma line). The notations

$$L_\gamma(\tau) = \int_{-i\infty+\varepsilon}^{i\infty+\varepsilon} L_\gamma(\eta)\, e^{\eta\tau}\, d\eta, \qquad L_\gamma(\eta) = \int_0^\infty e^{-\eta\tau} L_\gamma(\tau)\, d\tau;$$
$$\bar{L}_\gamma(\tau) = \int_{-i\infty+\varepsilon}^{i\infty+\varepsilon} \bar{L}_\gamma(\eta)\, e^{\eta\tau}\, d\eta, \qquad \bar{L}_\gamma(\eta) = \int_0^\infty e^{-\eta\tau} \bar{L}_\gamma(\tau)\, d\tau. \qquad (8)$$

are then introduced, where $L_\gamma(\eta)$ and $\tilde{L}_\gamma(\eta)$ in the right-hand semispace of the complex variables η are analytic functions; the $L_\gamma(\eta)$ are simply connected with $\tilde{K}_\gamma(\eta)$:

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$$\overline{L}_{\gamma}(\eta) - L_{\gamma}(\eta) = i\beta\hbar\widetilde{K}_{\gamma}(\eta), \quad (5),$$

$$\overline{L}_{\gamma}(s + i\Omega) + L_{\gamma}(s - i\Omega) = -\beta\hbar(1 - e^{-\beta\hbar\Omega})^{-1} 2\mathrm{Im}\,\widetilde{K}_{\gamma}(s + i\Omega). \quad (6).$$

These are obtained using a method by Larkin. Thus, all graphs can eventually be expressed by the $\widetilde{K}_{\gamma}(\eta)$. The sum of graphs (3a) and (3), e.g., is, after renormalization, equal to (6a), the renormalized graphs (3) and (3e) pass over to (6), the renormalization of (3) leads to additional graphs.

$$\widetilde{K}_{\gamma}(\eta) = \beta^{-1}\frac{P_{\gamma}(\eta)}{1 + u_{\gamma}P_{\gamma}(\eta)}, \qquad P_{\gamma}(\eta) = P_{\gamma}^{(e)}(\eta) + P_{\gamma}^{(i)}(\eta), \quad (7),$$

$$P_{\gamma}^{(e)}(\eta) = -\hbar^{-1}\sum_{q}\frac{n_{q+\gamma} - n_{q}}{i\eta + \omega_{q+\gamma,q}}, \qquad P_{\gamma}^{(i)}(\eta) = -\hbar^{-1}\sum_{q}\frac{N_{q+\gamma} - N_{q}}{i\eta + \Omega_{q+\gamma,q}}.$$

$$S_{ee} = V^{-2}\sum_{\gamma,q}\frac{2\pi}{\hbar^{2}}\delta(\omega_{p+\gamma,p} - \omega_{q+\gamma,q})\,|A_{\gamma}(\omega_{p+\gamma,p})|^{2} \times$$
$$\times (f_{p+\gamma}n_{q} + n_{p+\gamma}f_{q} - f_{p}n_{q+\gamma} - n_{p}f_{q+\gamma}), \quad (13)\text{-}(15)$$

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$$S_{ei} = V^{-2} \sum_{\gamma, q} \frac{2\pi}{\hbar^2} \delta(\omega_{p+\gamma, p} - \Omega_{q+\gamma, q}) |A_\gamma(\omega_{p+\gamma, p})|^2 \times$$
$$\times (f_{p+\gamma} N_q + n_{p+\gamma} \varphi_q - f_p N_{q+\gamma} - n_p \varphi_{q+\gamma}).$$

$$A_\gamma(\omega_{p+\gamma, p}) = \frac{u_\gamma V}{1 + u_\gamma P_\gamma(s + i\omega_{p+\gamma, p})}$$

is obtained for the impact term of the kinetic equation for the electron distribution function (N_q - equilibrium function of ion distribution). Finally,

$$\frac{\partial f_p}{\partial t} + (\mathbf{v}_p \nabla) f_p + e(\mathbf{E}\mathbf{v}_p) \frac{\partial n_p}{\partial \varepsilon_p} - e(\nabla\Psi, \mathbf{v}_p) \frac{\partial n_p}{\partial \varepsilon_p} = S_{ee} + S_{ei},$$
$$\Psi(\mathbf{x}, t) = e \int |\mathbf{x} - \mathbf{x}'|^{-1} V^{-1} \sum_q [f_q(\mathbf{x}', t) - \varphi_q(\mathbf{x}', t)] \, d\mathbf{x}'; \qquad (18)\text{-}(19)$$

are obtained for the equation of motion, where S_{ee} and S_{ei} are determined by (13) and (14). The role of an effective matrix element of transition

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for all collisions is played by the quantity $A_\gamma(\omega_{p+\gamma,p})$, for which holds:

$$|A_\gamma(\omega_{p+\gamma,p})|^2 = \frac{(4\pi e^2)^2}{(\gamma^2 + \Delta^2 I)^2 + \Delta^4\Gamma^2}\text{, and}$$

$$I_e = (n_0\beta\hbar V)^{-1}\sum_q \frac{n_q - n_{q+\gamma}}{\omega_{q+\gamma,q} - \omega_{p+\gamma,p}} \approx \frac{2}{\sqrt{\pi}}\int_0^\infty e^{-k^2}\,dk\,\frac{k^2}{k^2 - \beta\varepsilon_p\cos^2\psi},$$

$$\Gamma_e = (n_0\beta\hbar V)^{-1}\pi\sum_q (n_q - n_{q+\gamma})\,\delta(\omega_{q+\gamma,q} - \omega_{p+\gamma,p}) \approx \approx \sqrt{\pi\beta\varepsilon_p}\cos\psi\exp(-\beta\varepsilon_p\cos^2\psi), \qquad (21)\text{-}(24);$$

$$I_i = (n_0\beta\hbar V)^{-1}\sum \frac{N_q - N_{q+\gamma}}{\Omega_{q+\gamma,q} - \omega_{p+\gamma,p}} \approx \frac{2}{\sqrt{\pi}}\int_0^\infty e^{-k^2}\,dk\,\frac{k^2}{k^2 - \beta\varepsilon_p(M/m)\cos^2\psi},$$

$$\Gamma_i = (n_0\beta\hbar V)^{-1}\pi\sum_q (N_q - N_{q+\gamma})\,\delta(\Omega_{q+\gamma,q} - \omega_{p+\gamma,p}) \approx \approx \sqrt{\pi\beta\varepsilon_p M/m}\cos\psi\exp\left(-\beta\varepsilon_p\frac{M}{m}\cos^2\psi\right),$$

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ψ is the angle between the vectors p and γ, $\Delta^2 = 4\pi n_o e^2\beta$ is the reciprocal square of the Debye radius, and n_o is the electron (ion) concentration. The applicability of the formulas obtained depends upon the condition $4\pi e^2/\hbar v_T \ll 1$, where v_T is the thermal velocity of an electron. L. E. Gurevich is thanked for advice and discussions. There are 11 figures and 4 references: 3 Soviet-bloc and 1 non-Soviet-bloc.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk SSSR (Institute of Physics and Technology, Academy of Sciences USSR)

SUBMITTED: April 30, 1960

вектором k, E_k — энергия иона. Величины $r_{p,p+x}$, $R_{p,p+x}$, ω_{qp}

Fig. 2

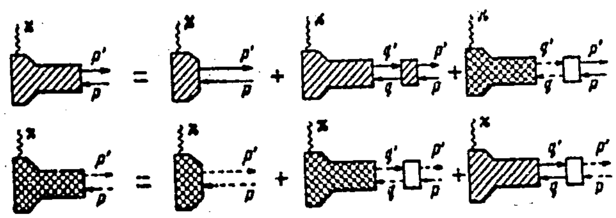

Fig. 2

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89299

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B102/B204

26.2421

AUTHORS: Gross, Ye. F., Zakharchenya, B. P., and Konstantinov, O. V.

TITLE: Effect of the inversion of a magnetic field in the exciton absorption spectrum of a CdS crystal

PERIODICAL: Fizika tverdogo tela, v. 3, no. 1, 1961, 305-308

TEXT: Studies of the effect of a magnetic field upon the absorption spectrum of CdS, on which the authors have made a report in Ref. 1, are intended to determine the exciton energy spectrum and its relation to the band structure in CdS. The experiments described here were carried out with 1 - 3μ thick foils of CdS single crystals, whose optical axis $\vec{A}$ was in the plane of the foil. $\vec{H}$ was either parallel or perpendicular to $\vec{A}$. ($\vec{A}$ is considered to be a vector, because the crystal has no inversion center). The crystals were cooled to 1.3°K and remained free from deformation. In the case of $\vec{E} \parallel \vec{A}$, the exciton absorption lines with λ = 4853, 4813, and 4806 A were weak and so narrow that the effect of the $\vec{H}$-field upon them could be easily observed. The line with λ = 4813 A, on

which the inversion effect could be best observed, had a satellite line with λ = 4814 A. At $\vec{A} \perp \vec{H}$, the 4813-line split up into a doublet, whose center of mass was shifted toward higher energies relative to the original line. The weak 4814-line, whose origin is not quite clear, is also split up into a doublet; the components are weak and not so far apart as those of the main line. In the case of inversion of the field direction, the manner of splitting is considerably changed (shift of the main doublet $\Delta\lambda$ = 0.4 A; intensity change). The essential change in the spectrum occurring when the field direction is inverted, consists in a shift of the Zeeman components and in a change of their intensity; the same effect is attained if the field is left as it is, and the crystal is rotated through 180°. Also the line with 4853 A, which is not split in the field, shows no effect of inversion. The line with 4806 A shows a complex splitting, and the inversion effect may be observed only with difficulty. The change of the absorption spectrum cannot be explained within the framework of the spectroscopy of an isolated atom, above all, because the effect is in contradiction to the invariance of the Schrödinger equation with respect to time reversal. The question is now

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examined as to what possibilities are left by the invariance of the quantum-mechanical equations with respect to the time reversal for excitons in the crystal. The invariance is formulated by means of the Onsager principle for the conduction tensor: $\sigma_{\mu\nu}(\vec{K},\omega,-\vec{H}) = \sigma_{\mu\nu}(-\vec{K},\omega,\vec{H})$. Then the power absorbed per cm^3 with a given λ and $\vec{H}/H$ $W(\vec{H}) = \frac{1}{2}\sum_{\mu,\nu} E_\mu E_\nu \mathrm{Re}\,\sigma_{\mu\nu}(\vec{K},\omega,\vec{H})$ and $W(-\vec{H}) = \frac{1}{2}\sum_{\mu,\nu} E_\mu E_\nu \mathrm{Re}\,\sigma_{\mu\nu}(-\vec{K},\omega,\vec{H})$. Herefrom, the change in the absorption spectrum in the case of inversion of $\vec{H}$ may be observed. In the presence of an inversion center in the absorbing medium, the effect would not be observable. The shift of the Zeeman components in the case of field inversion may be due to the following effect: The excitons excited by the electromagnetic wave move translatorily with $\vec{v} = \hbar\vec{k}/\mu$ (μ - effective exciton mass) and, in the presence of a constant magnetic field, they generate the field $\vec{E} = \hbar[\vec{K},\vec{H}]/c\mu$. In a crystal without inversion center, the exciton state has a dipole moment $\vec{d}$, and to the energy of the exciton in the magnetic field, $-(\vec{d},\vec{E})$ is added additively. $\vec{d}$ is parallel to $\vec{A}$, and the energy determining the shift

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Effect of the inversion of a magnetic... S/181/61/003/001/041/042
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equals $\Delta\varepsilon \sim (\vec{A},[\vec{k},\vec{H}])$. If any of these vectors are parallel, $\Delta\varepsilon = 0$ - and thus no effect may be observed, e.g., with $\vec{A} \parallel \vec{H}$. There are 1 figure and 6 references: 3 Soviet-bloc and 3 non-Soviet-bloc.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN SSSR imeni akad. A. F. Ioffe Leningrad (Institute of Physics and Technology of the AS USSR imeni Academician A. F. Ioffe, Leningrad)

SUBMITTED: August 24, 1960

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22145

S/056/61/040/003/025/031
B108/B209

24.7700 (1035,1043,1469)

AUTHORS: Kazarinov, R. F., Konstantinov, O. V.

TITLE: Dispersion theory of high-frequency exciton conductivity in a crystal

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 40, no. 3, 1961, 936-942

TEXT: The authors employ the graph technique suggested in Ref. 5 (O. V. Konstantinov, V. I. Perel'. ZhETF, 39, 197, 1960) for the calculation of high-frequency conductivity. They discuss direct transitions (without phonons) in which the energy maximum of the valency band and the minimum of the conduction band do not coincide in the momentum space. $\vec{K}_i$ are the threshold points for direct transition at the cutoff frequency ω_0. The excitons forming at these points on transition are equivalent, and their spectra coincide when the wave vector of light is neglected. These excitons are also formed when electrons of the mean velocity

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Dispersion theory of ...

this state, V the normalized volume, V_0 the volume of a lattice cell, and $\vec{b}_m$ and $\vec{b}_n$ are multiples of the vector of the reciprocal lattice; the dielectric constant ε is assumed to be a scalar. With formula (4a) from Ref. 5, the authors found the correction to the density matrix $f_{j\vec{p},j'\vec{p}'}$ to be proportional to the strength of the electric field applied $E_\mu(\vec{x},t) = E_\mu(\vec{\varkappa}, s)\exp(i\vec{\varkappa}\vec{x} + st)$, where $s = -i\omega + \nu$; $\vec{\varkappa}$ and ω denoting wave vector and frequency of light, ν an adiabatic parameter:

$$f_{jp,j'p'}(t) = E_\mu(\mathbf{x}, s)\, e^{st} \sum_{lk,l'k'} G^{l'k';j'p'}_{lk,jp}(s,\beta) \int e^{i\mathbf{x}x}\, j_\mu(\mathbf{x})_{lk,l'k'}\,d\mathbf{x}; \qquad (2a) \quad (2a)$$

$$G^{l'k';j'p'}_{lk,jp}(s,\beta) =$$

$$= Z^{-1}\int_{-\infty}^{0} e^{s\tau}\,d\tau \int_0^\beta d\lambda\,\mathrm{Sp}\left\{e^{-\beta H}\exp\left[\frac{H(\tau+i\hbar\lambda)}{i\hbar}\right]a^+_{jp}a_{j'p'}\exp\left[-\frac{H(\tau+i\hbar\lambda)}{i\hbar}\right]a^+_{lk}a_{l'k'}\right\}. \qquad (2б) \quad (2б)$$

$$(j_\mu(\mathbf{x}))_{lk,l'k'} = (e/2m)\,[\psi^*_{lk}(\mathbf{x})\,\hat{P}_\mu\psi_{l'k'}(\mathbf{x}) - \psi_{l'k'}(\mathbf{x})\,\hat{P}_\mu\psi^*_{lk}(\mathbf{x})], \qquad (2в) \quad (2в).$$

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Dispersion theory of ...

$Z = Sp.e^{-\beta H}$, $\beta = T^{-1}$, T is the absolute temperature in energy units. The quantities $G^{i'\vec{k}', j'\vec{p}'}_{i\vec{k}, j\vec{p}}(s,\beta)$ are determined by the graph method of Ref. 5. The case under consideration is characterized by one-electron states which are represented by Bloch wave functions. A combination of indices j and $\vec{p}$ corresponds to every line. Fig. 1 shows a peak illustrating electron-electron interaction corresponding to the factor subsequent to Fig. 1. The quasi-momentum of each line does not exceed half the vector of the reciprocal lattice by its absolute amount. Therefore, the quantity $(\vec{b}_n - \vec{b}_m)$ does not exceed the vector of the reciprocal lattice. The lines correspond to the factors $1 - n_{jp}$ or $n_{j\vec{p}}$, where $n_{j\vec{p}}$ is the Fermi function. The authors examine the case in which $T \ll \lambda\omega_0'$; $n_{j\vec{p}}$ equals unity when j is the index of a completely filled band, and equals zero when j refers to a band that is incompletely filled. The authors then discuss the various perturbation-theoretical approximations. Fig. 2 shows the case of

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zeroth approximation. Since the first-approximation terms have a common factor (Fig. 4b), one may introduce the quantity $F_{\vec{k}\vec{p}}^{\vec{k}'\vec{p}'}(s)$, where

$$G_{kp}^{k'p'}(s,\sigma) = \frac{1}{\sigma}\frac{\delta_{k+p,\,k'+p'}}{\sigma + \varepsilon_{ck} - \varepsilon_{vk'}} F_{kp}^{k'p'}(s). \qquad (5)$$

(5)

and

$$F_{kp}^{k'p'}(s) = \delta_{k'p}\left[s + i\hbar^{-1}(\varepsilon_{cp'} - \varepsilon_{vp})\right]^{-1} - (i\hbar)^{-1}\sum_{\gamma} F_{k,\,p+\gamma}^{k',\,p'+\gamma}(s)\frac{4\pi e^2\varepsilon^{-1}}{V\gamma^2}\Gamma_{cc}(p+\gamma,\,p,\,\gamma)\times \Gamma_{vv}(p',\,p'+\gamma,\,-\gamma)\left[s + \frac{i}{\hbar}(\varepsilon_{cp'} - \varepsilon_{vp})\right]^{-1}. \qquad (6)$$

(6).

With the identity $R(p,k') \equiv F_{\vec{k}'+\vec{\varkappa},\vec{p}}^{\vec{k}',\vec{p}'+\vec{\varkappa}}$ (8), the authors obtain the following final result:

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Dispersion theory of ...

$$R(\mathbf{p}, \mathbf{k}') = \begin{cases} \frac{1}{V}\sum_n \frac{\varphi_n(\mathbf{p}-\mathbf{K}_1-\boldsymbol{\lambda})\varphi_n^*(\mathbf{k}'-\mathbf{K}_1-\boldsymbol{\lambda})}{s+i(\omega_n+v^i\varkappa)}, & \mathbf{p}, \mathbf{k}' \sim \mathbf{K}_1+\boldsymbol{\lambda}, \\ \frac{1}{V}\sum_n \frac{\varphi_n(\mathbf{p}-\mathbf{K}_l-\boldsymbol{\lambda})\varphi_n^*(\mathbf{k}'-\mathbf{K}_l-\boldsymbol{\lambda})}{s+i(\omega_n+v^i\varkappa)}, & \mathbf{p}, \mathbf{k}' \sim \mathbf{K}_l+\boldsymbol{\lambda}. \end{cases} \quad (13) \qquad (13),$$

where $\hbar\omega_n = E_0 + \frac{1}{2} M^{-1}_{\alpha\beta} \hbar^2 \varkappa_\alpha \varkappa_\beta + \varepsilon_n$; the wave function $\varphi_n(\vec{q})$ of an exciton in the n-th state satisfies the equation

$$\mu^{-1}_{\alpha\beta}\frac{\hbar^2}{2} q_\alpha q_\beta \varphi_n(\mathbf{q}) - \sum_{\boldsymbol{\gamma}}{}' \frac{4\pi e^2 \varepsilon^{-1}}{\gamma^2 V}\varphi_n(\mathbf{q}+\boldsymbol{\gamma}) = \varepsilon_n \varphi_n(\mathbf{q}) \quad (14) \qquad (14).$$

With Fourier transformation, this leads to the Schrödinger equation for the motion of the exciton. With Eqs. (13), (8), (5), and (2a), the authors obtain the following expression for high-frequency conductivity:

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$$\sigma_{\nu\mu}(\varkappa, \omega) = E_0^{-1}(2\pi)^{-6} \sum_{n,l} \int dp\, dk' \frac{\varphi_n(p - K_l - \lambda)\varphi_n^*(k' - K_l - \lambda)}{s + i(\omega_n + v^l\varkappa)} j_\mu(k', \varkappa) j_\nu^*(p, \varkappa). \quad (16)$$

(16).

For allowed transitions where $j_\mu(\vec{K}_l, 0) \neq 0$, this expression is simplified because for long-range excitons, $\varphi(\vec{p} - \vec{K}_l - \vec{\lambda})$ is non-vanishing only in the immediate neighborhood of the point $\vec{K}_l + \vec{\lambda}$ in the $\vec{p}$ space. Neglecting the dependence of $j_\mu(\vec{k}', \vec{\varkappa})$ on $\vec{k}'$, one obtains

$$\chi_{\nu\mu}(\varkappa, \omega) = \frac{e^2}{\hbar} \sum_n |\tilde{\varphi}_n(0)|^2 \sum_j \frac{r_{\sigma c}^{\nu}(K_j) r_{c\sigma}^{\mu}(K_j)}{(\omega - \omega_n - v^j\varkappa) + i\nu}, \quad (17)$$

(17)

$$r_{\sigma c}^{\nu}(K_j) = \int_{V_0} \psi_{\sigma K_j}^*(r)\, r^\nu\, \psi_{cK_j}(r)\, dr.$$

for high-frequency exciton polarizability. This formula is analogous to that for a gas. The authors thank L. E. Gurevich and V. I. Perel' for numerous discussions. There are 5 figures and 7 references: 3 Soviet-bloc and 4 non-Soviet-bloc. The two references to English-language publications read as follows: Ref. 1: R. I. Elliott. Phys. Rev., 108, 1383, 1957; Ref. 7: J. J. Hopfield. Phys. Rev., 112, 1555, 1958.

ASSOCIATION: Leningradskiy fiziko-tekhnicheskiy institut Akademii nauk SSSR (Leningrad Institute of Physics and Technology of the Academy of Sciences USSR)

SUBMITTED: October 19, 1960

Рис. 1
Fig.1

$$\pm (i\hbar)^{-1} \sum_{mn} \frac{4\pi e^2 \varepsilon^{-1}}{V(p_3 - p_1 + b_n)^2} \Gamma_{j_1 j_3}(p_1, p_3, p_3 - p_1 + b_n) \times$$
$$\times \Gamma_{j_2 j_4}(p_2, p_4, p_2 - p_4 - b_m)\, \delta_{p_1+p_2-p_3-p_4,\, b_m - b_n} .$$

APPROVED FOR RELEASE: 06/19/2000 CIA-RDP86-00513R000824410012-9"

KONSTANTINOV, O.V.; PEREL', V.I.

Precise determination of the kinetic coefficients for a plasma.
Zhur.eksp.i teor.fiz. 41 no.4:1328-1329 O '61. (MIRA 14:10)

1. Leningradskiy fiziko-tekhnicheskiy institut AN SSSR.
(Gases, Kinetic theory of) (Plasma (Ionized gases))

35362
S/057/62/032/003/016/019
B117/B101

26.2324

AUTHORS: Zaydel', A. N., ~~Konstantinov, O. V.~~, and Malyshev, G. M.

TITLE: Spectroscopic measurements of ionic energies on a "Zeta"-type plant

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 32, no. 3, 1962, 370 - 372

TEXT: The relationship between ionic energy and nuclear-charge number was checked on the basis of experimental data. A relationship between the ionic charge and the width of spectral lines of these ions had already been established in the first investigation conducted on the "Zeta" plant (Ref. 1, see below). Most of the results were satisfactorily described by the relations $E_i = \alpha z$ (1) or $E_i = \beta z^2$ (2). The data determined recently by Jones and Wilson (Ref. 10, see below) on the same plant concerning energies of ions with different mass and nuclear-charge numbers were explained by stating that the ionic energy as a function of charge was purely accidental. They suggested the following relations:

$$E_i \sim z^2/M_i, \quad E_i \sim M_i, \quad \text{and} \quad E_i = \text{const},$$

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Spectroscopic measurements of...

and used a two-term interpolation formula $E_i = E_o + (M_i/M_D)e$ (3) to attain an agreement between experimental and theoretical data. They assumed "thermalization" of the plasma. A calculation of the data given in the paper mentioned, however, showed that the experimental results were described equally well by the interpolation formula (1) with only one parameter as by formula (3) with two parameters. Thus, the investigations conducted on the "Zeta" and "Alfa" plants confirmed that the energy of ions increased with increasing nuclear-charge number. Formula (3) was found to give a deuteron temperature of ~100 ev. The mechanism of ionic acceleration by electrostatic fields of plasma waves, which is not impossible for the "Zeta" plant either, presupposes a deuteron temperature below the electron temperature (20 - 30 ev), i.e., near the value of α in (1). There are 1 table and 13 references: 2 Soviet and 11 non-Soviet. The four most recent references to English-language publications read as follows: Ref. 1: P. C. Thonemann et al., Nature, 181, 217, 1958; Ref. 10: B. B. Jones, R. Wilson. Report no. 057 read at the Konferentsiya po issledovaniyam v oblasti fiziki plazmy i upravlyaye-mogo yadernogo sinteza (Conference on Investigations in the Field of Plasma Physics and Controlled Nuclear Synthesis), Salzburg, 1961; A. S. Kaufman et al. Proc. Phys. Soc., 76, 17, 1960; B. Bernstein, R. M. Kulsrud. Phys. Fluids, 3, 937, 1960. X

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L 14694-63 EWT(1)/BDS/EEC(b)-2 AFFTC/ASD/ESD-3/RADC/SSD Pi-4 GG/
IJP(C)/WG
ACCESSION NR: AP3005279 S/0056/63/045/002/0279/0284

68

AUTHOR: Konstantinov, O. V.; Perel', V. I.

TITLE: Coherence of states in the scattering of modulated light

SOURCE: Zhur. eksper. i teoret. fiz., v.45, no. 2, 1963, 279-284

TOPIC TAGS: coherent scattering, coherent state, scattering atom, modulated light, intensity-modulated light, modulation depth, excited state

ABSTRACT: A theory is proposed to explain the scattering of intensity-modulated light for the case when the scattering atom has closely spaced excited states. This theory accounts for the experimental observations of resonance increase in the modulation depth of scattered light when the modulation frequency coincides with Zeeman splitting of the excited term (Ye. B. Aleksandrov. Optika i spektroskopiya, 14, 436, 1963). "The authors express their gratitude to Ye. B. Aleksandrov and V. P. Kozlov for a stimulating discussion." Orig. art. has: 21 formulas and 1 figure.

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A. F. Ioffe Akademii nauk SSSR (Physicotechnical Institute, Academy of Sciences SSSR)

SUBMITTED: 31 Jan 63 DATE ACQ: 06 Sep 63 ENCL: 00

SUB CODE: PH NO REF SOV: 003 OTHER: 001

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L 17797-63 EWT(1)/BDS AFFTC/ASD/IJP(C)/SSD GG

ACCESSION NR: AP3007069 S/0056/63/045/003/0503/0510 58 57

AUTHOR: Aleksandrov, Ye. B.; Konstantinov, O. V.; Perel', V. I.; Khodovoy, V. A.

TITLE: Modulation of scattered light with the aid of parametric resonance

SOURCE: Zh. eksper. i teoret. fiziki, v. 45, no. 3, 1963, 503-510

TOPIC TAGS: parametric resonance, scattered light modulation, cadmium vapor, cadmium excited state, scattered light intensity modulation, rf cadmium lamp, cadmium luminescence, interference between excited states

ABSTRACT: A theoretical and experimental study of the resonance scattering of light by cadmium vapor in a weak magnetic field has been carried out. The effect examined is caused by the interference of two excited states, occurring during modulation of the energy interval between them. Linearly polarized light from an rf cadmium lamp excited the resonance luminescence of Cd vapor at 200C in a Wood-type horn-shaped vessel. Luminescence with a wavelength of

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3261Å was detected by a photomultiplier. The rf magnetic field (1030 kc) was established by a solenoid surrounding the vessel, with additional modulation produced by a 30-cps high-voltage signal which was used as the base voltage for the synchronous detector. The constant magnetic field was imposed by a system of Helmholtz rings. This field was slowly varied to obtain the resonance curve. The excited state of the Cd vapor was split into a Zeeman triplet, and the intensity of scattered light was modulated by the frequency of the rf field and integral multiples of that frequency. The extent of modulation and the mean intensity of luminescence showed resonant maxima when the difference of the frequencies of σ-components was an integral multiple of the rf modulation frequency. A possible combination of the effects of resonance scattering of modulated light and parametric resonance was indicated. When the modulation frequencies of the field and the light do not coincide, the intensity of scattered light will contain combination harmonics. Orig. art. has: 5 figures and 22 formulas.

ASSOCIATION: Opticheskiy institut im. S. I. Vavilova (Institute of Optics)

SUBMITTED: 09Apr63 DATE ACQ: 08Oct63 ENCL: 00

SUB CODE: PH NO REF SOV: 003 OTHER: 005

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EWT(k)/T/EWA(h) Pz-6/Peb IJP(c)/ASD(a)/AFETR/AFTC(a)/
(a)-5/AS(mp)-2/ESD(gs)/ESD(t) AT
NR: AP4048415 S/0181/64/006/011/3364/3371

AUTHORS: Konstantinov, O. V.; Perel', V. I.

TITLE: Recombination waves in semiconductors

SOURCE: Fizika tverdogo tela, v. 6, no. 11, 1964, 3364-3371

TOPIC TAGS: recombination, carrier density, electron capture, hole capture, impurity level

ABSTRACT: It is shown that if the rates of capture of electrons and holes by deep impurities in a semiconductor are noticeably different, then the flow of direct current through the semiconductor can excite longitudinal waves (recombination waves), and that these waves are self-excited when the minority carriers are sufficiently dense or the electric field strong enough. Recombination waves are stabilized by the fact that the electron lifetimes are limited, that the carriers can diffuse, and that the neutralization of the traps

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equalizes the carrier capture rate. A detailed theory, accounting for all these factors, is developed, and the conditions under which the recombination waves are unstable are determined. "The authors thank V. I. Stafayev for numerous useful discussions." Orig. art. has: 1 figure and 27 formulas.

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A. F. Ioffe AN SSSR, Leningrad (Physicotechnical Institute, AN SSSR)

SUBMITTED: 04Jun64 ENCL: 00

SUB CODE: SS NR REF SOV: 002 OTHER: 003

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S/0051/64/016/002/0193/0200

ACCESSION NR: AP4020921

AUTHOR: Aleksandrov,Ye.B.; Konstantinov,O.V.; Perel', V.I.

TITLE: Conversion of the frequency of modulation of light by parametric and double resonance

SOURCE: Optika i spektroskopiya, v.16, no.2, 1964, 193-200

TOPIC TAGS: modulation frequency conversion, light modulation conversion, radiation modulation, parametric resonance, double resonance, Zeeman effect, magnetic field splitting, luminescence modulation, harmonic combination, dual modulation, light scattering, cadmium

ABSTRACT: In resonance scattering of modulated light by atoms whose excited state is a Zeeman triplet, the depth of modulation of the luminescence is resonance-dependent on the splitting magnetic field; the degree of modulation exhibits a maximum when the modulation frequency agrees with the frequency of the sigma component of the line. On the other hand, in scattering of light of constant intensity (nonmodulated), one can obtain modulated luminescence by applying, in addition to the constant splitting magnetic field, an alternating field perpendicular or parallel

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to the constant one. In the former case there obtains "double resonance"; in the latter case, "parametric resonance". Modulation frequency conversion incident to parametric and double resonance is discussed and analyzed theoretically; the discussion is based on earlier publications of the authors. It is shown that incident to application of an alternating field, in addition to the constant one, there should appear in the luminescence intensity harmonics not only with the frequencies of the incident light modulation and field modulation, but also with combination frequencies. The amplitude of the combination harmonics is resonance-dependent on the strength of the constant field. The experimental part of the study was carried out on a set-up consisting of an oscillator feeding a coil via an rf amplifier, a photomultiplier, a tuned amplifier and a detector assembly. The set-up was similar to that described earlier by the authors (ZhETF, 45, 503, 1963). Radiation associated with the 5^3P_1--5^1S_0 transition in cadmium vapor (contained in a tube surrounded by the above-mentioned coil) was observed. The purpose of the experiments was not to obtain detailed data, but only to demonstrate the feasibility of modulation frequency conversion. A modulation amplitude versus field strength curve is reproduced. The experimental results are consistent with the predictions of theory. "In conclusion, the authors take pleasure in expressing their gratitude to A.M.Bonch-Bruyevich for his interest in the work and valuable advice." Orig.art.has: 51 formulas

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